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the angles at the join RX will be right, and therefore we abide in the same hypothesis of right angle.

Since however the length of the perpendiculars can be similarly increased indefinitely, under the same base AB, the hypothesis of right angle subsisting, it is to be demonstrated that the same hypothesis will always abide in any case of diminution of those perpendiculars; which indeed is thus evinced.

Assume in AR, and BX any two equal perpendiculars AL, BK and join LK. If the angles at the join LK are not right, nevertheless they will be (P. I.) equal to each other.

Therefore they will be toward the one part, as suppose toward AB obtuse, and toward RX acute, since certainly the angles here at each of those points are equal (Eu. I. 13.) to two rights. But it also holds that the perpendiculars LR, KX, those standing on RX, will be mutually equal. Therefore (P. III.) LK will be greater indeed than the opposite RX, and less than the opposite AB.

But this is absurd; because AB, and RX have been shown equal.

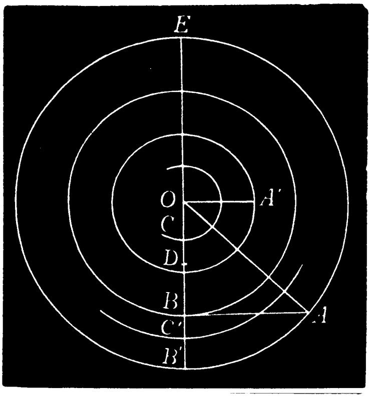
Therefore the hypothesis of right angle is not changed by any diminution of the perpendiculars, whilst abides the once posited base AB.

But neither is the hypothesis of right anglechanged for any diminution, or greater amplitude of the base; since manifestly may be considered as any base the perpendicular BK, or BX, and therefore may be considered in turn as perpendiculars that AB, and the equal opposite sect KL, or XR. Therefore is established that the hypothesis of right angle, if even in a single case it be true, always in every case it alone is true. Quod erat demonstrandum.

A PROOF OF THE PHYTHAGOREAN PROPOSITION.

By Professor ANDREW INGRAHAM, President of the Swain Free School, New Bedford, Massachusetts.

I. The circle whose radius is the hypothenuse is equivalent to the two circles having the base and the altitude for their respective radii.



Let the triangle OBA, rightangled at B, revolve in the plane of the paper about O. The diagram shows that the circle generated by OA is equivalent to the circle generated by OB and the annule generated by BA.

This proves the proposition to one who knows that the annule generated by BA is equivalent to the circle whose radius is BA.

II. The annule generated by a straight line perpendicular to a given line from any point in the same, while the latter revolves in their common plane around any of its own points as a centre, is equivalent to the circle which has the former line for radius.

Let OC be named R. Take $OD=2R$, $OC'=lR$, $BC'=C'B'=\frac{R}{l}$.

Now $BA=\sqrt{EB.\ BB'}=\sqrt{\left(lR+\frac{R}{l}+lR-\frac{R}{l}\right)\frac{2R}{l}}=2R=OA'$ and

$$OC : OC'=BC' : OC=BB' : OD.$$

Circum. OC : Circum. $OC'=BB' : OD$.

$\therefore$ OD. Circum. $OC=BB'$.Circum. OC'. Circle OA'=annule BA.

THE NEBULAR HYPOTHESIS.

By **REV. A. L. GRIDLEY, Pastor of Congregational Church, Kidder, Missouri.**

About twenty-five years ago while the writer of this atricle was a student in college, in speaking of the Nebular Hypothesis he told the Professor of mathematics that he believed that the impossibility of the said hypothesis could be proved by mathematics. He believed that the contraction could not have proceeded in such a way as to produce the necessary velocities at various times to perpetuate a revolution around the center.

With this belief he began work but had not proceeded far before he found that so far from disproving the possibility of the hypothesis he had discovered a clue by which he could estimate within very narrow limits the necessary rate of contraction from the orbit of one planet to that of another.

He would now venture nothing as to the truth of the hypothesis but if it be a true one,and the Solar Systen has evolved from a former nebulous mass, the time necessarily occupied in forming the liquid globes now constituting the planets of our system can be closely calculated.

In compliance with repeated requests from one of the editors of the "Journal" the calculations are here given.

The law may be briefly stated as follows: *The orbital velocity of any interior planet is the resultant of the orbital velocity of the next exterior planet and the contracting force.* For example the orbital velocity of Jupiter is greater than that of its exterior planet Saturn. Its velocity is the resultant of the velocity of rotation when the mass reached to Saturn and of the contracting force from that point to the present orbit of Jupiter. We have then the resultant of two forces and one of the forces to find the other and any one familiar with mechanics would give the rule: *From the square of the resultant subtract the square of the known force and the square root of the remainder will be the required force.*